the end of its tendrils, and as it climbs up a support each new tendril is enabled by its power of seeking for darkness rather than light to find out little dark crannies in which to place its feet. On the other hand a bryony climbs by seizing anything it can get hold of, and as each tendril reaches out towards the light the whole plant will tend to be dragged towards the lighter side of the bush or hedge on which it clambers.

It looks as if the case might be put thus: Given the fact that light produces some kind of movement, the convenience of the plant shall decide whether it be towards the light or away from it; or in other words, grant the plant the power of knowing where the centre of the earth is, and grant it the power of knowing where the light comes from, then the plant itself can decide what course of growth is most advantageous.[1]

(*To be continued.*)

NOTES

THE subscription for M. Leverrier's statue is progressing favourably. A sum of 4,200 francs has been already collected. The subscribers up to the present moment number thirty-five, almost all of them belonging to the French Institute. M. Cohen, of Antwerp, sent 1,000 francs. Other large sums are expected soon from different parts.

IT is stated that M. Faye has declined to stand for the direction of the Paris Observatory, unless it is agreed to retain at the observatory the International Meteorological Office. It is very probable that the long spoken of Meteorological Institute will now be established; at all events a solution of the pending question will soon be adopted by the government.

M. DUMAS announced to the Paris Academy of Sciences at its sitting on March 4 that an anonymous donor offers a prize of 6,000 francs to be awarded in 1880 to the person who makes the most useful application of M. Pasteur's researches to the healing art.

A COMMITTEE has been formed at Königsberg to erect a fitting monument upon the grave of the great philosopher Immanuel Kant. The City authorities have headed the list of subscriptions with the sum of 4,000 marks (200*l.*).

IN a report by M. Daubrée to the Paris Academy of Sciences it is strongly recommended that measures should be taken to preserve the many boulders which are scattered over France, and many of which are disappearing under the pick-axe of the builder. The Academy has appointed a commission for the purpose, which will have delegates in the principal districts of the country. Similar measures have been taken in Switzerland since 1866, and our Scotch geologists deserve praise for their zeal on behalf of the preservation of the boulders of their country, and for their excellent periodical reports on the subject.

GEN. DUFF, in a letter to the Earl of Derby, dated Gothenburg, January 4, reports that great shoals of herrings of the large kind which disappeared from this coast in the year 1809 have now made their appearance again north of Gothenburg. The first appearance of the herring took place at Christmas, when whales were seen following the shoals toward the coast. Preparations were made by the merchants of Gothenburg to make good use of this godsend. It would appear from the history and traditions of Sweden that, after an interval of seventy years, there are some grounds for supposing that the shoals of herrings may be expected to visit the coast regularly for fifty or sixty years to come, as has been the case during earlier periods. The Swedish Government have appointed Professors Sars and Smitt to inquire into the various questions raised by this sudden appearance of the herring shoals off this part of the Swedish coast, the more important of these questions being the alleged disappearance of the shoals from the coast of Norway, whither, it is said, they have betaken themselves since 1808, and the bearing of the inquiry on the future of the fishery.

THE first National Entomological Exhibition commenced on Thursday at the Royal Aquarium, Westminster, and is thoroughly creditable to all concerned. There are altogether about 250 exhibitors contributing between eight and nine hundred cases, with an average of at least 300 insects per case; and the whole of the specimens shown, with very few exceptions, have been collected by ladies and gentlemen and artisans, in their leisure hours.

WE regret to learn the death of Joachim Monteiro, at Delagoa Bay. He was an active and enterprising naturalist, whose work on Angola will give him an enduring place in the literature of African travel, no less than his services in procuring and sending to this country a great part of the fine series of specimens from which *Welwilschia* was originally described.

THE death is announced of Sulhiz Kurz, the Curator of the Herbarium of the Calcutta Botanic Garden. Possessed of an extensive knowledge of Indian botany, he had recently completed the preparation of a Flora of British Burma for the Indian Forest Department. He died at Penang on his way to the islands of the Malayan Archipelago, for the purpose of botanical exploration.

A LETTER has been written by the Municipal Council of Paris to the director of the Meteorological Service of the Observatory asking that the publication of weather telegrams and prognostications be made in Paris as well as in provincial towns.

A GREAT prehistoric burial ground has recently been discovered at Cremmen (in the district of East-Havelland, Prussia), not far from Berlin. Numerous urns and ash-jars of varied form, all containing ashes and bones of burnt human remains, have been found. The urns are mostly round in shape, and stood some 2½ to 3 feet below the surface upon a large slab of stone; they were surrounded by round stones, and each was covered with a flat stone lid. The antiquities will all be deposited in the Provincial Museum of Berlin.

AN International Agricultural Exhibition will take place at Hamburg on June 13, and will last 5 days; and another exhibition of this nature will be held at Prague on May 15, 16, and 17.

THE Royal Society for Agriculture and Botany of Ghent, will hold its Horticultural International Exhibition on March 31 next. These exhibitions are quinquennial, and last for seven days. The coming one promises to be unusually brilliant, to judge from the copious list of names of exhibitors.

WE are glad to see that a beginning has been made in the formation of a local museum at Tenby, the proposal for which we referred to some time since. The magnificent geological collection of the late Mr. Smith, of Gumfreston, has been purchased. The Corporation of Tenby has given the old National School-rooms on the Castle Hill, and after some slight alterations have been made they will be admirably well adapted for a museum. In addition to the geological specimens there will be a valuable collection of British shells, and one of Pembrokeshire birds and eggs; also a library of scientific books. It would be idle to speak of the advantage this institution is likely to confer on the town, and on all the residents in South-west Wales, where nothing worthy of the name of a museum at present exists. About 300*l.* is still required before the museum can be opened. The trustees ought to have no difficulty in raising this moderate sum in the district concerned; perhaps some of our readers might like to contribute. The hon. secretary is Mr. Edward Laws, Tenby.

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[1] I have spoken as if the existence of positive and negative helio- and geotropism could be simply explained by considering the convenience of the plant. But in details many difficulties arise; for instance, some roots are heliotropic. (Sachs' "Text Book," p. 755.)

The *Spectator* learns from a private letter that the telephone has been adopted by the Chinese, the telegraph being useless, as they have no alphabet. Five hundred miles, it is stated, have already been spoken over in China. Mr. H. F. Stevens writes from Tabreez, Persia, that conversation and music were transmitted satisfactorily by telephone between that town and Tiflis, along the line of the Indo-European Telegraph Company.

At a recent meeting of the East Kent Natural History Society, Prof. Gulliver exhibited a very extensive series of drawings of raphides and other crystals found in the tissues of plants. Mr. Gulliver considers that sufficient attention has not hitherto been directed to the part played by these deposits of mineral salts in the vital economy of the plant, or, from the soluble condition in which they are presented, in the nutrition of the animals which feed on them.

Apropos of the note in Nature (vol. xvii. p. 311) relating to a recent attempt to send certain fish to America, Mr. Carrington, of the Westminster Aquarium, writes that there are in the Royal Aquarium, Westminster, at least eighteen species of fish from American waters. In return he has exported a number of sea-water animals, including fish, molluscs, crustaceans, and zoophytes. At first a large proportion of specimens was lost during the voyage, but now there are seldom any lost, either on the homeward or outward voyages. In addition to the constant attention necessary at sea, Mr. Carrington finds the great secret of success is to have the animals subjected to confinement for some weeks before shipment.

Messrs. Longman have published an abridged edition of Dr. Pole's excellent "Life of Sir W. Fairbairn." The personal narrative has been retained entire, the scientific and technical portions being much abridged. The little work deserves, and no doubt will have, a wide circulation.

We are pleased to see that the *Natural History Journal*, conducted by the Societies in Friends' Schools, whose appearance we noted a year ago, has reached the beginning of a second volume. Of the 170 contributors sixty-three, we learn, have been boys and girls. The journal is well conducted and, judging from the number before us, its contents are well calculated to interest its young readers in science.

In Nature, vol. xii. p. 514, W. W. Wood, writing from Manila, describes a species of Navicula (?) with a gelatinous ciliated envelope, which is there figured. Mr. Wood announced his intention of submitting his specimens to a competent diatomist, but three years have nearly elapsed, and no more has been said on the subject. It is one of such extreme importance as bearing on the ordinary motion of diatoms, that Mr. G. S. Boulger writes asking for an explanation.

Many of our readers will be sorry to hear of the death, on Monday last, of the old hippopotamus, in the Gardens of the Zoological Society. He was obtained in the White Nile when only a few days old, in 1849, and has been in the Gardens since 1850. Prof. Garrod, F.R.S., will communicate the results of his examination of the body to an early meeting of the Zoological Society.

With reference to a note in Nature (vol. xvii. p. 38) respecting the uninflammability of eucalyptus, Mr. A. Nicols writes that this must be a mistake, as in Australia the wood is extensively used as fuel. Acclimatisation of these really valuable trees, Mr. Nicols thinks, should be strongly supported. They yield timber of immense size and strength, durable alike in dry or wet situations, and more proof against the attacks of *termites* than many other woods, and some work up into beautiful furniture. They would probably thrive wherever the mean annual temperature is not below 60°, or, roughly speaking, over an area of about one-half of the habitable region of the earth.

The provisional observatory at Meudon is in full operation, as we reported some months ago. Dr. Janssen has done such good work that the ministry will propose to restore the old palace which is now in ruins, and establish a splendid physical observatory in an admirable situation. A credit of 250,000 francs is to be asked for; this will include the purchase of a refractor 0m. 67 in. diameter.

The governor of the French island, Reunion, in the Indian Ocean, reports that this colony was visited by a terrible cyclone on January 15, causing great losses of life and property.

Under the auspices of the Deutscher Fischerei-Verein, 2,000,000 salmon eggs are hatched annually, and distributed among the various rivers of the empire. Strong efforts are now being made to introduce extensively the grayling, which is comparatively rare in Germany.

In the February session of the Berliner polytechnische Gesellschaft, Dr. F. Siemens, of Dresden, the inventor of the new compressed hard glass, gave an interesting exhibition of this new invention. The process has been brought to such perfection, that the hard glass is not only more easily, but more cheaply manufactured than the ordinary glass. The power of resistance varies from eight to ten times that of ordinary glass. The serious objection made to hard glass at the time of its discovery, that it often fell to pieces when entirely unexposed to pressure, has been successfully avoided. This property was found to result from over-hardening, and it is now possible to detect all articles which have acquired it, by the use of the polarisator, under which over-hardened glass shows a prevalence of violet tints. This condition is also detected by exposure to water at a certain temperature.

The working out of the results obtained by the Transit of Venus expeditions sent out by the German Government, were expected to have been far enough advanced for publication in the year 1877. It has been found, however, that this task causes more difficulties and expenses than had been at first anticipated. The Imperial Chancellor's office has therefore demanded from the German Parliament an extra credit of 500*l.* to defray the additional costs.

A useful invention has recently been made by Herr Weber, of Hummel-Radeck, near Lübben (Prussia). This gentleman has contrived to construct a very simple machine for levelling roads, which for working requires only two horses, a driver, and a labourer, and renders it possible to make such improvements in a road, in a short time, as could otherwise be accomplished only by fifty or sixty workmen. The machine works equally well upon gravel or clay soil, and its cost is only forty-five marks (shillings). The whole machine works much in the same way as an ordinary carpenter's plane does upon wood.

On January 25, shortly after noon, the belfry of Toucy (Yonne) was struck by lightning, and set on fire. According to Dr. Roche (who describes the case), the wind was blowing from the north-west, and a dense, low cloud had begun to cover the ground with large hailstones. A few minutes after a single and prolonged thunder peal was heard, and the cross on the belfry was then seen to be surrounded by a luminous meteor. Persons in the houses near the church saw coming from the base of the belfry two fire-balls of about 0·30m. to 0·40m. diameter, and about 0·50m. apart. They rolled on the steps of the building about 20m. and disappeared. A woman in a room about 15m. from the belfry was carried to the end of the room; a young man who was passing was thrown on the ground, and several other persons were more or less shaken. Immediately after the thunder peal the hail ceased and was replaced by a snow-storm which lasted three-quarters of an hour. It was afterwards found that the belfry was fired at two points—one at the upper part of the north-west side, the other at the lower part of the south-east side, probably the points of entrance and exit of the electric fluid. Toucy stands in the middle of a narrow valley, running north-west, and is rarely visited by thunderstorms, which pass nearly always to the right or left.

SOME researches on the magnetic properties of nickel were recently made by the well-known physicist M. H. Wild, and are now published in the *Bulletin* of the Imperial Academy of Sciences of St. Petersburg. M. Wild arrives at the following conclusions: (1) Pure nickel can become permanently magnetic to a considerable degree, thus differing materially from pure (soft) iron. The maximum qnantity of permanent magnetism which pure nickel can retain is, however, only between one half and one-third of that quantity which hard steel can permanently retain. (2) Magnetism is less permanent in nickel than in well-hardened steel, after the magnetising force has ceased to act; the slow loss of magnetism in course of time, as well as by heating and cooling, is comparatively greater in nickel than in steel; and this is the case even if the nickel has, like hard steel, by repeated heating and cooling, been brought to a certain state of permanent capacity. (3) The temperature coefficient of nickel magnets in the latter state is a little larger than that of properly hardened steel. (4) The temporary magnetism which pure nickel can retain is about double its permanent quantity, or about one half of the temporary magnetism which hard steel, and about one quarter of that which soft iron can retain. In its magnetic properties nickel is, therefore, thoroughly inferior to iron and steel.

THE question with regard to the existence of microscopic organisms in media containing no oxygen has been a fruitful subject of discussion for biologists of late, and some doubts have been thrown on the entire absence of this gas in the experiments cited by Pasteur and others. Prof. von Nägeli, in his work on "Die niederen Pilze," which has just appeared in Munich, presents some interesting figures in this connection. According to his calculations the larger bacteria weigh $\frac{1}{2500000000}$ milligramme. If we assume that they consume the same amount proportionally of oxygen daily as a man, viz., 1 per cent. of his weight, then a million bacteria would require in twenty-four hours $\frac{1}{20000}$ milligramme, or nearly $\frac{1}{30000}$ cubic centimetre of oxygen. These calculations, taken in connection with the well-known difficulties of entirely eliminating gases, will probably render a repetition of the best experiments necessary.

FROM recent experiments on the spread of gases through bodies, Dr. Wroblewsky (*Pogg. Ann.*) arrives at the following conclusion:—When a gas is absorbed it spreads in the absorbent body according to the same laws as those ruling the propagation of heat in a solid bar; and that whether the absorbent body be liquid or solid, or in a transition state between these two extremes." The only exceptions to this law are attributable to the action of gravity. It is known that the excretion of carbonic acid by an animal is increased by a violent muscular action, but it has been uncertain whether the CO_2 is a direct product of muscular action, *i.e.*, belongs to the substances which, through decomposition processes, are formed in greater measure during contraction of the muscles. To clear up this point, M. Sedgwick-Minot recently forced through the vascular system of detached muscles of dogs (the blood having been removed) a quantity of blood-serum saturated with oxygen, and determined the proportion of CO_2 in the serum in a series of cases in which the muscles were at rest, and in another series in which they were repeatedly stimulated to contraction. If the contraction of the muscle caused a greater formation of CO_2, the serum, after passage, must contain more CO_2 than if the muscle remained at rest. The experiments, however, gave equal quantities of CO_2 in the two cases, and the reason of the fact referred to at the outset is not determined.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from India, presented respectively by Capt. Pole Carew, and Mr. Henry Wright; a Green Monkey (*Cercopithecus callitrichus*), two Common Chameleons (*Chamœleon vulgaris*) from West Africa, presented by Mr. G. H. Garrett; a Herring Gull (*Larus argentatus*), European, presented by Mr. Capstick; two Undulated Grass Parrakeets (*Melopsittacus undulatus*) from Australia, presented by Mr. Hylton Jolliffe; an American Darter (*Plotus anhinga*) from South America, purchased; two Sambur Deer (*Cervus aristotelis*), an Isabelline Bear (*Ursus isabellinus*) from India, a Javan Adjutant (*Leptoptilus javanicus*) from Java, received in exchange.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—Mr. J. R. Terry, M.A., Fellow of Magdalen College, who was Fifth Wrangler at Cambridge in 1873, has accepted the senior mathematical mastership in Magdalen College School; and Mr. D. C. Robb, B.A., scholar of Worcester College, has been appointed to a science mastership (in physics) at the same time.

CAMBRIDGE.—The report of the Council of the Senate recommending the appointment of an assistant to Prof. Hughes has been confirmed upon the understanding that the person to be appointed be not permitted to take private pupils.

EDINBURGH.—A movement has originated in the University of Edinburgh to procure a portrait of Prof. Balfour, in recognition of his services to the University in having for thirty years acted as Dean of the Medical Faculty. This movement has been joined in by the Fellows of the Royal Society of Edinburgh, in recognition on their part of the services he has for many years rendered to the Society in the character of Secretary.

BIRKBECK INSTITUTION.—A course of six lectures on Electric Telephony will be delivered by Mr. W. J. Wilson, F.C.S., on Saturday evenings, at eight o'clock, commencing March 23. The entire proceeds will be given to the fund now being raised for the erection of a new building for the institution. The lectures will be very fully illustrated by experiments, diagrams, &c., and will form a complete exposition of the subject.

PARIS.—M. Pierre Picard is proposed as a successor to the late Claude Bernard in the chair of physiology at the Collége de France. He was for a long time assistant to the famous physiologist, and is himself the author of valuable researches on the constitution of the blood corpuscles. At present he is a professor in the Faculty of Medicine at Lyons.

ALGERIA.—M. Bardoux proposes to establish in Algeria three preparatory schools for medical and law students, one in each of the three provinces. At present Algiers alone is provided with a preparatory school of medicine. The means for obtaining superior instruction, which have been very limited up to the present in the colony, will be greatly enlarged.

BERLIN.—On the night of the 8th instant the professors and students of the Berlin University, assisted by civil and military dignitaries, held a grand "Commers," or beer-drinking revelry, in the time-honoured style of German academical life, in honour of the sixtieth anniversary of the birthday of Prof. A. Hofmann, the celebrated chemist. The proceedings began by the secretary of the committee reading a letter from the Chamberlain of the Crown Prince expressing the regret of his Imperial Highness at being prevented from attending the festivity. After this Prof. Helmholtz, the Rector of the Berlin University, formally congratulated Dr. Hofmann, who replied in a speech to the felicitations addressed to him by his Berlin colleagues and friends. Numerous other speakers, among them Privy-Councillor Jacob, Chief of the Patent Office, and Prof. Reuleaux, Rector of the Berlin Polytechnic Academy, then addressed the hero of the day. The official part of the festivity closed at 2 o'clock, after which came the singing of all the obligatory songs and the delivery of student speeches. Not a few congratulatory letters and telegrams reached Prof. Hofmann on the auspicious day from England, America, and France.

PRUSSIA.—The three agricultural institutes of Prussia are attended at present by 270 students, of whom 215 are from Prussia, 20 from other parts of Germany, and 35 from foreign countries.